AMENDMENTS TO THE CLAIMS

1. (currently amended) A micro-shape transcription method comprising:

~~preparing a mold having a transcription face on which a concavo-convex pattern is formed,~~

pressing <u>a mold having a</u> ~~the~~ transcription face against a base material ~~softened by heating~~ <u>heated to a pressing temperature that is about 180°C to transcribe a micro pattern to a surface of the base material</u>,

~~then forcibly~~ separating the mold from the base material <u>at a separating temperature that ranges from 120-150°C</u> ~~to transcribe a reverse pattern of the concavo-convex pattern to the surface of the base material,~~

~~wherein when assuming a temperature for pressing the mold against the base material as T_1 (°C), a temperature for separating the mold from the base material as T_2 (°C), thermal expansion coefficients of the mold and the base material as α_a and α_b, and the maximum distance between the transcription center of the transcription face and the concavo-convex pattern as d (mm), the timing of the forcible separation of the mold from the base material is determined so that the following relations (1), and (2):~~

$\cancel{T_1 \geq T_2}$ ——————————— ~~…(1)~~

$\cancel{|\alpha_a - \alpha_b| \cdot (T_1 - T_2) \cdot d \leq 4 \times 10^{-2}}$ ——— ~~…(2)~~

~~are simultaneously satisfied~~.

2. (original) The micro-shape transcription method according to claim 1, wherein the transcription face of the mold is a plane or stepped plane.

3-4. (canceled)

5. (currently amended) The micro-shape transcription method according to claim 1 or 2, wherein the ~~concavo-convex pattern~~ transcription face has a line width of 100 μm or less.

6. (currently amended) The micro-shape transcription method according to claim 1 or 2, wherein the ~~concavo-convex pattern~~ transcription face has a depth of 1 μm or more.

7. (currently amended) The micro-shape transcription method according to claim 1 or 2, wherein the base material ~~uses~~ comprises an optically-transparent thermoplastic resin or glass.

8. (original) The micro-shape transcription method according to claim 7, wherein the thermoplastic resin is selected from the group consisting of polyolefin-, polymethyl-methacrylate-, polycarbonate-, norbornane-, and acrylic-based resins.

9. (currently amended) A micro-shape transcription apparatus comprising:

a first mold means provided with a transcription face having a micro-shape ~~that is rectangular in cross section~~;

a second mold means facing the first mold means and holding a base material thereon;

a mechanism for driving at least one of the first and second mold means to press the transcription face into the base material and to ~~forcibly~~ separate the first mold means from the base material;

~~a heating source for controlling temperatures of the first and second mold means such that when a temperature for pressing the transcription face against the base material is~~ $\cancel{T_1}$ ~~(°C), a temperature for separating the transcription face from the base material is~~ $\cancel{T_2}$ ~~(°C), thermal expansion coefficients of the transcription face and the base material are~~ $\cancel{\alpha_a}$ ~~and~~ $\cancel{\alpha_b}$~~, and a maximum distance between a transcription center of the transcription face and a concavo-convex pattern is d (mm), wherein the mechanism drives said first mold means when the following relations (1) and (2):~~

$\cancel{T_1 \geq T_2}$ ...~~(1)~~

$\cancel{|\alpha_a - \alpha_b| \cdot (T_1 - T_2) \cdot d \leq 4 \times 10^{-2}}$ ...~~(2)~~

$\cancel{|\alpha_a - \alpha_b| \geq 50 \times 10^{-7}/°C}$ ...~~(3)~~

~~are simultaneously satisfied; and~~

a vacuum chuck for attracting and fixing the base material to the second mold means;

wherein the mechanism presses at a temperature up to 180°C and separates at a temperature ranging from 100 to 150°C, said separating temperature being less than said pressing temperature.

10. (currently amended) An optical-component manufacturing method wherein a pattern for controlling light of an optical component is formed in accordance with the micro-shape transcription method of claim 1 ~~or 2~~.

11. (currently amended) An optical ~~waveguide~~ component manufacturing method wherein a pattern corresponding to a core of an optical ~~component~~ waveguide is formed in accordance with the micro-shape transcription method of claim 1 ~~or 2~~.

12-13. (canceled)

14. (currently amended) ~~The~~ A micro-shape transcription method ~~of claim 1,~~ comprising:

pressing a mold having a transcription face against a base material heated to a pressing temperature that is about 160°C to transcribe a micro pattern to a surface of the base material, and

separating the mold from the base material at a separating temperature that ranges from 100-140°C

~~wherein T_1 is 160°C and T_2 ranges from 100-140°C~~.

15-18. (canceled)

19. (new) The micro-shape transcription apparatus according to claim 9, wherein the micro shape is rectangular in cross-section.

20. (new) The micro-shape transcription apparatus according to claim 9, wherein the micro shape has a depth of approximately 5 μm and a width of approximately 8 μm.

21. (new) The micro-shape transcription apparatus according to claim 9, wherein the first mold means has a protective coating.

22. (new) The micro-shape transcription method according to claim 1, wherein separating the mold from the base material is determined so that an equation

$|\alpha_a - \alpha_b| \cdot (T_1 - T_2) \cdot d \leq 4 \times 10^{-2}$ is satisfied,

wherein:

α_a and α_b are thermal expansion coefficients of the mold and the base material,

T_1 is a temperature (°C) for pressing the mold against the base material is and T_2 is a temperature for separating the mold from the base material as (°C), and

d is a maximum distance (mm) between a transcription center of the transcription face and the pattern.

23. (new) The optical-component manufacturing method according to claim 10 or 11, wherein the base material has a first refractive index, said method further comprising:

embedding a resin having a second refractive index that differs from the first refractive index of the base material into the pattern.

24. (new) The optical-component manufacturing method according to claim 23, further comprising:

placing a layer over the resin embedded in the pattern.

25. (new) The optical-component manufacturing method according to claim 24, wherein the base material and the layer comprise a second resin.

26. (new) The optical-component manufacturing method according to claim 23, wherein the resin is an epoxy resin.

27. (new) The optical-component manufacturing method according to claim 25, wherein the second resin is a polyolefin resin.

28. (new) The optical-component manufacturing method according to claim 10, wherein the optical component is an optical waveguide, diffraction grating, polarizer, or lens.

29. (new) The optical-component manufacturing method according to claim 11, further comprising:

embedding an epoxy resin having a refractive index approximately 0.3% higher than the base material into the pattern to form the core having a top surface and a bottom surface; and

placing a covering material on the top surface of the core.

30. (new) A method to control operating parameters of a micro-shape transcription apparatus which presses a mold having a transcription face on which a concavo-convex pattern is formed against a base material softened by heating, and forcibly separates the

mold from the base material to transcribe a reverse pattern of the concavo-convex pattern to the surface of the base material,

wherein the forcible separation of the mold from the base material is performed based on a study by using a temperature for pressing the mold against the base material and a temperature for separating the mold from the base material as the operating parameters, in consideration of a difference between thermal expansion coefficients of the mold and the base material, and the maximum distance between the transcription center of the transcription face and the concavo-convex pattern.

31. (new) The method to control operating parameters of a micro-shape transcription apparatus according to claim 30, wherein when assuming the temperature for pressing the mold against the base material as T_1 (°C), the temperature for separating the mold from the base material as T_2 (°C), the thermal expansion coefficients of the mold and the base material as α_a and α_b, and the maximum distance between the transcription center of the transcription face and the concavo-convex pattern as d (mm), the following relations (1) and (2) :

$$T_1 \geq T_2 \qquad \ldots(1)$$

$$|\alpha_a - \alpha_b| \cdot (T_1 - T_2) \cdot d \leq 4 \times 10^{-2} \qquad \ldots(2)$$

are simultaneously satisfied.